A Varied and Diverse Diet Can Lead to Increasing BMI for Poor Children
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In this month’s issue of Pediatrics, Fernandez et al¹ invite us to consider that a diverse diet (DD) and varied diet should not be advocated to prevent obesity. They studied children and their primary caregivers who were enrolled in Head Start in southeastern Michigan to provide a window on US low-income, preschool-aged children of mixed race/ethnicity. They applied the Harvard Service Food Frequency Questionnaire to assess usual frequency of food consumed in low-income mothers and preschool-aged children and the Berry Index to develop a DD. The authors found that the mean BMI for the primary caregiver was 32.4. Girls and older children ate a more diverse diet. Whites had a lower mean DD and food-insecure households had a higher mean Moderation Foods Variety score. Moderation foods (fried, salty, high-fat, and sweets) are foods that should be decreased in the diet. Healthy foods (grains, fruits, vegetables, dairy, and protein) are foods that should be increased. What compelled the investigators to reconsider increasing DD as a strategy to prevent obesity was their observation of no association between the scores and concurrent BMI z score (BMIz). In addition, the authors found that a greater healthy variety, overall variety, and DD each was associated with a larger annual increase in BMIz. When stratified by initial BMI, the obese group showed an association between Healthy Foods Variety and DD and an increased BMIz. The nutrition provided to children in Head Start and the education provided to their caregivers are based on the Dietary Guidelines for Americans (DGA). If these findings are substantiated, then a frame-shift in the DGA is necessary for children. The guidelines, published jointly by the US Department of Health and Human Services and the US Department of Agriculture, seek to promote health, prevent chronic disease, and help people reach and maintain a healthy weight by providing evidence-based food and beverage recommendations. The DGA are based on scientific recommendations from the National Academy of Medicine.²

Children enrolled in Head Start are poor³ and thus are at risk of obesity and undernutrition. The time a child spends in a Head Start program is variable as are the number of meals consumed during that time. Depending on the program, children can take as few as 5 meals or as many as 15 meals plus snacks each week. Parents are not usually present and would not know what the child consumed at those meals.

DD is a qualitative measure of food consumption that reflects household access to a variety of foods and serves as a proxy for nutrient adequacy of the diet of individuals.⁴ Individual diversity scores aim to reflect nutrient adequacy and serve as measures for macro- and/or micronutrient sufficiency.⁵ An increase in DD of healthy foods is promoted internationally because it is associated with positive health outcomes and in adults can be inversely associated with body adiposity.⁶ This makes the findings of Fernandez et al puzzling, especially because they sought to correlate healthy foods with BMI.

References:
⁴ Digestive Diseases and Nutrition Center, Women and Children’s Hospital University at Buffalo, Buffalo, New York.
⁵ Opinions expressed in these commentaries are those of the author and not necessarily those of the American Academy of Pediatrics or its Committees.
⁶ DOI: 10.1542/peds.2015-3807
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Although statistically significant, biologically, the finding of an increase in the BMIz only in the obese group for DD and healthy food variety is small. There was no significant increase in BMIz in the low, normal, or overweight groups and there was no significant decrease in BMIz in the overweight group.

No primary data are shown in this report. Presentation of the primary data would inform the interpretation of at least 2 findings. The groupings in the authors’ Table 5 miss an important concept. Healthy children growing at the third to fifth percentile would not be expected to change BMIz over 20 months, but children at or under the first percentile would, hopefully, increase percentiles. Similarly, although the authors account for caloric intake when calculating DD and dietary variety, caloric intake is not presented. Self-reported intake data suffer from inaccurate reporting by subjects; obese individuals can underreport caloric intake by as much as 40%.

Fernandez et al provide nutrition data on a group of children who are rarely, if at all, studied in the United States and who are at risk. It is a commendable first step. This report does not yet suggest that the dietary advice given to American children should be changed, but it begs for follow-up data.

**ABBREVIATIONS**

BMIz: BMI z score  
DD: diverse diet  
DGA: Dietary Guidelines for Americans

**REFERENCES**


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